

# Linking the Kansas KAP Assessments to NWEA MAP Tests

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## Introduction

Northwest Evaluation Association™ (NWEA™) is committed to providing partners with useful tools to help make inferences from the Measures of Academic Progress® (MAP®) interim assessment scores. One important tool is the concordance table between MAP and state summative assessments. Concordance tables have been used for decades to relate scores on different tests measuring similar but distinct constructs. These tables, typically derived from statistical linking procedures, provide a direct link between scores on different tests and serve various purposes. Aside from describing how a score on one test relates to performance on another test, they can also be used to identify benchmark scores on one test corresponding to performance categories on another test, or to maintain continuity of scores on a test after the test is redesigned or changed. Concordance tables are helpful for educators, parents, administrators, researchers, and policy makers to evaluate and formulate academic standing and growth.

Recently, NWEA completed a concordance study to connect the scales of the Kansas Assessment Program (KAP) English Language Arts (ELA) and Mathematics with those of the MAP Reading and MAP for Mathematics assessments. In this report, we present the 3<sup>rd</sup> through 8<sup>th</sup> and 10<sup>th</sup> grade cut scores on MAP reading and mathematics scales that correspond to the benchmarks on the KAP ELA and math tests. Information about the consistency rate of classification based on the estimated MAP cut scores is also provided, along with a series of tables that predict the probability of receiving a Level 3 (i.e., “Proficient”) or higher performance designation on the KAP assessments, based on the observed MAP scores taken during the same school year. A detailed description of the data and analysis method used in this study is provided in the Appendix.

## Overview of Assessments

KAP includes a series of computer-based achievement tests aligned to the Kansas College and Career Ready Standards (KCCRS) in ELA, math, science, history/government, and social studies. For each grade and subject, there are three cut scores that distinguish performance into four levels with Level 1 as the lowest and Level 4 as the highest. The Level 3 cut score demarks the minimum level of performance considered to be “Proficient” for accountability purposes.

MAP tests are interim assessments that are administered in the form of a computerized adaptive test (CAT). MAP tests are constructed to measure student achievement from Grades K to 12 in math, reading, language usage, and science and aligned to KCCRS. Unlike KAP, MAP assessments are vertically scaled across grades, a feature that supports direct measurement of academic growth and change. MAP scores are reported on a Rasch Unit (RIT) scale with a range from 100 to 350. Each subject has its own RIT scale.

To aid interpretation of MAP scores, NWEA periodically conducts norming studies of student and school performance on MAP. For example, the NWEA 2015 RIT Scale norming study (Thum & Hauser, 2015) employed multi-level growth models on nearly 500,000 longitudinal test scores from over 100,000 students that were weighted to create large, nationally representative norms for math, reading, language usage, and general science.

## Estimated MAP Cut Scores Associated with KAP Readiness Levels

Tables 1 to 4 report the KAP scaled scores associated with each of the four performance levels, as well as the estimated cut scores on the MAP tests associated with the KAP performance levels. Specifically, Tables 1 and 2 apply to MAP scores obtained during the spring testing season for reading and math, respectively. Tables 3 and 4 apply to MAP tests taken in a prior testing season (fall or winter) for reading and math, respectively. The tables also report the percentile rank (based on the *NWEA 2015 MAP Norms*) associated with each estimated MAP cut score. The MAP cut scores can be used to predict students' most probable KAP performance level, based on their observed MAP scores. For example, a 4<sup>th</sup> grade student who obtained a MAP math score of 230 in the spring testing season is likely to be at the very high end of Level 3 on the KAP taken during that same testing season (see Table 2). Similarly, a 3<sup>rd</sup> grade student who obtained a MAP reading score of 210 in the fall testing season is likely to be at Level 4 on the KAP taken in the spring of 3<sup>rd</sup> grade (see Table 3).

TABLE 1. CONCORDANCE OF PERFORMANCE LEVEL SCORE RANGES BETWEEN KAP ELA AND MAP READING (WHEN MAP IS TAKEN IN SPRING)

Grade	KAP							
	Level 1		Level 2		Level 3		Level 4	
3	220-275		276-299		<b>300</b> -326		327-380	
4	220-270		271-299		<b>300</b> -334		335-380	
5	220-274		275-299		<b>300</b> -325		326-380	
6	220-276		277-299		<b>300</b> -335		336-380	
7	220-274		275-299		<b>300</b> -334		335-380	
8	220-264		265-299		<b>300</b> -333		334-380	
10	220-268		269-299		<b>300</b> -333		334-380	

  

Grade	MAP							
	Level 1		Level 2		Level 3		Level 4	
	RIT	%ile	RIT	%ile	RIT	%ile	RIT	%ile
3	100-186	1-21	187-201	22-57	<b>202</b> -215	58-86	216-350	87-99
4	100-187	1-10	188-206	11-51	<b>207</b> -223	52-88	224-350	89-99
5	100-200	1-22	201-215	23-59	<b>216</b> -228	60-87	229-350	88-99
6	100-208	1-31	209-221	32-65	<b>222</b> -237	66-93*	238-350	93*-99
7	100-212	1-35	213-226	36-70	<b>227</b> -243	71-95*	244-350	95*-99
8	100-213	1-33	214-232	34-78	<b>233</b> -248	79-96*	249-350	96*-99
10	100-218	1-43	219-235	44-79	<b>236</b> -251	80-95	252-350	96-99

Notes. 1. %ile=percentile.

2. Bolded numbers indicate the cut scores considered to be at least “proficient” for accountability purposes.

3. \* reflects occasional departure from one-to-one correspondence between RITs and percentiles due to the larger range of the RIT scale relative to the percentile scale.

TABLE 2. CONCORDANCE OF PERFORMANCE LEVEL SCORE RANGES BETWEEN KAP AND MAP MATH (WHEN MAP IS TAKEN IN SPRING)

Grade	KAP							
	Level 1		Level 2		Level 3		Level 4	
3	220-275		276-299		<b>300</b> -328		329-380	
4	220-265		266-299		<b>300</b> -330		331-380	
5	220-272		273-299		<b>300</b> -325		326-380	
6	220-272		273-299		<b>300</b> -328		329-380	
7	220-265		266-299		<b>300</b> -341		342-380	
8	220-273		274-299		<b>300</b> -335		336-380	
10	220-274		275-299		<b>300</b> -332		333-380	

  

Grade	MAP							
	Level 1		Level 2		Level 3		Level 4	
	RIT	%ile	RIT	%ile	RIT	%ile	RIT	%ile
3	100-188	1-14	189-203	15-50	<b>204</b> -217	51-84	218-350	85-99
4	100-197	1-14	198-219	15-65	<b>220</b> -234	66-91	235-350	92-99
5	100-211	1-27	212-231	28-73	<b>232</b> -246	74-93	247-350	94-99
6	100-211	1-20	212-232	21-66	<b>233</b> -246	67-89	247-350	90-99
7	100-214	1-21	215-239	22-73	<b>240</b> -256	74-94*	257-350	94*-99
8	100-229	1-47	230-248	48-82	<b>249</b> -261	83-94	262-350	95-99
10	100-234	1-54	235-254	55-85	<b>255</b> -270	86-96*	271-350	96*-99

Notes. 1. %ile=percentile.

2. Bolded numbers indicate the cut scores considered to be at least “proficient” for accountability purposes.

3. \* reflects occasional departure from one-to-one correspondence between RITs and percentiles due to the larger range of the RIT scale relative to the percentile scale.

TABLE 3. CONCORDANCE OF PERFORMANCE LEVEL SCORE RANGES BETWEEN KAP ELA AND MAP READING (WHEN MAP IS TAKEN IN FALL OR WINTER PRIOR TO SPRING KAP TESTS)

Grade	KAP							
	Level 1		Level 2		Level 3		Level 4	
3	220-275		276-299		<b>300</b> -326		327-380	
4	220-270		271-299		<b>300</b> -334		335-380	
5	220-274		275-299		<b>300</b> -325		326-380	
6	220-276		277-299		<b>300</b> -335		336-380	
7	220-274		275-299		<b>300</b> -334		335-380	
8	220-264		265-299		<b>300</b> -333		334-380	
10	220-268		269-299		<b>300</b> -333		334-380	
MAP FALL								
Grade	Level 1		Level 2		Level 3		Level 4	
	RIT	%ile	RIT	%ile	RIT	%ile	RIT	%ile
3	100-173	1-17	174-191	18-58	<b>192</b> -208	59-89	209-350	90-99
4	100-176	1-8	177-198	9-50	<b>199</b> -218	51-90	219-350	91-99
5	100-192	1-19	193-209	20-59	<b>210</b> -225	60-90	226-350	91-99
6	100-202	1-28	203-217	29-66	<b>218</b> -235	67-94	236-350	95-99
7	100-208	1-34	209-223	35-72	<b>224</b> -241	73-96*	242-350	96*-99
8	100-209	1-31	210-230	32-80	<b>231</b> -246	81-96	247-350	97-99
10	100-216	1-40	217-233	41-78	<b>234</b> -249	79-95	250-350	96-99
MAP WINTER								
Grade	Level 1		Level 2		Level 3		Level 4	
	RIT	%ile	RIT	%ile	RIT	%ile	RIT	%ile
3	100-182	1-19	183-198	20-57	<b>199</b> -213	58-88	214-350	89-99
4	100-183	1-8	184-204	9-52	<b>205</b> -222	53-89	223-350	90-99
5	100-197	1-20	198-213	21-59	<b>214</b> -227	60-88	228-350	89-99
6	100-206	1-29	207-220	30-66	<b>221</b> -236	67-93	237-350	94-99
7	100-210	1-33	211-225	34-71	<b>226</b> -242	72-95	243-350	96-99
8	100-212	1-33	213-231	34-79	<b>232</b> -247	80-96	248-350	97-99
10	100-217	1-41	218-234	42-79	<b>235</b> -250	80-96*	251-350	96*-99

Notes. 1. %ile=percentile.

2. Bolded numbers indicate the cut scores considered to be at least "proficient" for accountability purposes.

3. \* reflects occasional departure from one-to-one correspondence between RITs and percentiles due to the larger range of the RIT scale relative to the percentile scale.

TABLE 4. CONCORDANCE OF PERFORMANCE LEVEL SCORE RANGES BETWEEN KAP AND MAP MATH (WHEN MAP IS TAKEN IN FALL OR WINTER PRIOR TO SPRING KAP TESTS)

Grade	KAP							
	Level 1		Level 2		Level 3		Level 4	
3	220-275		276-299		<b>300</b> -328		329-380	
4	220-265		266-299		<b>300</b> -330		331-380	
5	220-272		273-299		<b>300</b> -325		326-380	
6	220-272		273-299		<b>300</b> -328		329-380	
7	220-265		266-299		<b>300</b> -341		342-380	
8	220-273		274-299		<b>300</b> -335		336-380	
10	220-274		275-299		<b>300</b> -332		333-380	
MAP FALL								
Grade	Level 1		Level 2		Level 3		Level 4	
	RIT	%ile	RIT	%ile	RIT	%ile	RIT	%ile
3	100-174	1-11	175-190	12-50	<b>191</b> -205	51-87	206-350	88-99
4	100-185	1-11	186-208	12-68	<b>209</b> -223	69-94*	224-350	94*-99
5	100-201	1-24	202-221	25-75	<b>222</b> -236	76-95	237-350	96-99
6	100-203	1-18	204-224	19-67	<b>225</b> -239	68-92*	240-350	92*-99
7	100-208	1-19	209-233	20-74	<b>234</b> -250	75-95*	251-350	95*-99
8	100-224	1-45	225-244	46-84	<b>245</b> -257	85-95	258-350	96-99
10	100-232	1-54	233-252	55-87	<b>253</b> -268	88-97*	269-350	97*-99
MAP WINTER								
Grade	Level 1		Level 2		Level 3		Level 4	
	RIT	%ile	RIT	%ile	RIT	%ile	RIT	%ile
3	100-182	1-11	183-198	12-50	<b>199</b> -212	51-85	213-350	86-99
4	100-192	1-12	193-214	13-65	<b>215</b> -229	66-92	230-350	93-99
5	100-207	1-26	208-227	27-74	<b>228</b> -242	75-95*	243-350	95*-99
6	100-208	1-19	209-229	20-67	<b>230</b> -243	68-90	244-350	91-99
7	100-212	1-21	213-237	22-74	<b>238</b> -254	75-95*	255-350	95*-99
8	100-227	1-46	228-246	47-82	<b>247</b> -259	83-95*	260-350	95*-99
10	100-233	1-53	234-253	54-86	<b>254</b> -269	87-97*	270-350	97*-99

Notes. 1. %ile=percentile.

2. Bolded numbers indicate the cut scores considered to be at least "proficient" for accountability purposes.

3. \* reflects occasional departure from one-to-one correspondence between RITs and percentiles due to the larger range of the RIT scale relative to the percentile scale.

## Consistency Rate of Classification

Consistency rate of classification (Pommerich, Hanson, Harris, & Sconing, 2004), expressed in the form of a rate between 0 and 1, provides a means to measure the departure from equity for concordances (Hanson et al., 2001). This index can also be used as an indicator for the predictive validity of the MAP tests, i.e., how accurately the MAP scores can predict a student's proficiency status in the KAP test. For each pair of concordant scores, a classification is considered consistent if the examinee is classified into the same performance category regardless of the test used for making a decision. Consistency rate provided in this report can be calculated as, for the "proficient" performance category concordant scores, the percentage of examinees who score at or above both concordant scores plus the percentage of examinees who score below both concordant scores on each test. Higher consistency rate indicates stronger congruence between KAP and MAP scores. The results in Table 5 demonstrate that on average, MAP reading scores can consistently classify students' proficiency (Level 3 or higher) status on KAP ELA test approximately 85% of the time and MAP math scores can consistently classify students on KAP math test approximately 89% of the time. Those numbers are high, suggesting that both MAP reading and math tests are great predictors of the students' proficiency status on the KAP tests.

TABLE 5. CONSISTENCY RATE OF CLASSIFICATION FOR MAP AND KAP LEVEL 3 EQUIPERCENTILE CONCORDANCES

Grade	ELA/Reading			Math		
	Consistency Rate	False		Consistency Rate	False	
		Positives	Negatives		Positives	Negatives
3	0.85	0.08	0.07	0.86	0.08	0.06
4	0.87	0.07	0.06	0.86	0.08	0.06
5	0.83	0.08	0.09	0.88	0.07	0.05
6	0.84	0.07	0.09	0.87	0.06	0.07
7	0.82	0.07	0.11	0.90	0.05	0.05
8	0.86	0.07	0.07	0.93	0.03	0.04
10	0.86	0.10	0.04	0.92	0.03	0.05

## Proficiency Projection

Proficiency projection tells how likely a student is classified as “proficient” on KAP tests based on his/her observed MAP scores. The conditional growth norms provided in the 2015 MAP Norms were used to calculate this information (Thum & Hauser, 2015). The results of proficiency projection and corresponding probability of achieving “proficient” on the KAP tests are presented in Tables 6 to 8. These tables estimate the probability of scoring at Level 3 or above on KAP in the spring and the prior fall or winter testing season. For example, if a 3<sup>rd</sup> grade student obtained a MAP math score of 195 in the fall, the probability of obtaining a Level 3 or higher KAP score in the spring of 3<sup>rd</sup> grade is 73%. Table 6 presents the estimated probability of meeting Level 3 benchmark when MAP is taken in the spring, whereas Tables 7 and 8 present the estimated probability of meeting Level 3 benchmark when MAP is taken in the fall or winter prior to taking the KAP tests.

TABLE 6. PROFICIENCY PROJECTION AND PROBABILITY FOR PASSING KAP LEVEL 3  
(PROFICIENT) WHEN MAP IS TAKEN IN THE SPRING

Grade	ELA/Reading					Math				
	Start %ile	RIT Spring	Projected Proficiency			Start %ile	RIT Spring	Projected Proficiency		
			Cut Score	Level 3	Prob.			Cut Score	Level 3	Prob.
3	5	174	202	No	<0.01	5	181	204	No	<0.01
	10	179	202	No	<0.01	10	186	204	No	<0.01
	15	183	202	No	<0.01	15	189	204	No	<0.01
	20	186	202	No	<0.01	20	192	204	No	<0.01
	25	188	202	No	<0.01	25	194	204	No	<0.01
	30	191	202	No	<0.01	30	196	204	No	<0.01
	35	193	202	No	<0.01	35	198	204	No	0.02
	40	195	202	No	0.01	40	200	204	No	0.08
	45	197	202	No	0.06	45	202	204	No	0.25
	50	199	202	No	0.17	50	203	204	No	0.37
	55	201	202	No	0.38	55	205	204	Yes	0.63
	60	202	202	Yes	0.50	60	207	204	Yes	0.85
	65	204	202	Yes	0.73	65	209	204	Yes	0.96
	70	207	202	Yes	0.94	70	211	204	Yes	0.99
	75	209	202	Yes	0.99	75	213	204	Yes	>0.99
	80	211	202	Yes	>0.99	80	215	204	Yes	>0.99
	85	214	202	Yes	>0.99	85	218	204	Yes	>0.99
	90	218	202	Yes	>0.99	90	221	204	Yes	>0.99
	95	223	202	Yes	>0.99	95	226	204	Yes	>0.99
4	5	181	207	No	<0.01	5	189	220	No	<0.01
	10	187	207	No	<0.01	10	194	220	No	<0.01
	15	190	207	No	<0.01	15	198	220	No	<0.01
	20	193	207	No	<0.01	20	201	220	No	<0.01
	25	196	207	No	<0.01	25	203	220	No	<0.01
	30	198	207	No	<0.01	30	206	220	No	<0.01
	35	200	207	No	0.01	35	208	220	No	<0.01
	40	202	207	No	0.06	40	210	220	No	<0.01
	45	204	207	No	0.17	45	212	220	No	<0.01
	50	206	207	No	0.38	50	213	220	No	0.01
	55	208	207	Yes	0.62	55	215	220	No	0.04
	60	210	207	Yes	0.83	60	217	220	No	0.15
	65	212	207	Yes	0.94	65	219	220	No	0.37
	70	214	207	Yes	0.99	70	221	220	Yes	0.63
	75	216	207	Yes	>0.99	75	224	220	Yes	0.92
	80	218	207	Yes	>0.99	80	226	220	Yes	0.98
	85	221	207	Yes	>0.99	85	229	220	Yes	>0.99
	90	225	207	Yes	>0.99	90	233	220	Yes	>0.99
	95	230	207	Yes	>0.99	95	238	220	Yes	>0.99

TABLE 6. (CONTINUED)

Grade	ELA/Reading					Math				
	Start %ile	RIT Spring	Projected Proficiency			Start %ile	RIT Spring	Projected Proficiency		
			Cut Score	Level 3	Prob.			Cut Score	Level 3	Prob.
5	5	188	216	No	<0.01	5	195	232	No	<0.01
	10	193	216	No	<0.01	10	201	232	No	<0.01
	15	197	216	No	<0.01	15	205	232	No	<0.01
	20	199	216	No	<0.01	20	208	232	No	<0.01
	25	202	216	No	<0.01	25	210	232	No	<0.01
	30	204	216	No	<0.01	30	213	232	No	<0.01
	35	206	216	No	<0.01	35	215	232	No	<0.01
	40	208	216	No	0.01	40	217	232	No	<0.01
	45	210	216	No	0.03	45	219	232	No	<0.01
	50	212	216	No	0.11	50	221	232	No	<0.01
	55	214	216	No	0.27	55	223	232	No	<0.01
	60	216	216	Yes	0.50	60	225	232	No	0.01
	65	217	216	Yes	0.62	65	228	232	No	0.08
	70	220	216	Yes	0.89	70	230	232	No	0.25
	75	222	216	Yes	0.97	75	232	232	Yes	0.50
	80	224	216	Yes	0.99	80	235	232	Yes	0.85
	85	227	216	Yes	>0.99	85	238	232	Yes	0.98
	90	231	216	Yes	>0.99	90	242	232	Yes	>0.99
	95	236	216	Yes	>0.99	95	248	232	Yes	>0.99
6	5	192	222	No	<0.01	5	198	233	No	<0.01
	10	197	222	No	<0.01	10	204	233	No	<0.01
	15	201	222	No	<0.01	15	208	233	No	<0.01
	20	203	222	No	<0.01	20	211	233	No	<0.01
	25	206	222	No	<0.01	25	214	233	No	<0.01
	30	208	222	No	<0.01	30	217	233	No	<0.01
	35	210	222	No	<0.01	35	219	233	No	<0.01
	40	212	222	No	<0.01	40	221	233	No	<0.01
	45	214	222	No	0.01	45	223	233	No	<0.01
	50	216	222	No	0.03	50	225	233	No	<0.01
	55	218	222	No	0.11	55	227	233	No	0.02
	60	219	222	No	0.17	60	230	233	No	0.15
	65	221	222	No	0.38	65	232	233	No	0.37
	70	223	222	Yes	0.62	70	234	233	Yes	0.63
	75	226	222	Yes	0.89	75	237	233	Yes	0.92
	80	228	222	Yes	0.97	80	239	233	Yes	0.98
	85	231	222	Yes	>0.99	85	243	233	Yes	>0.99
	90	235	222	Yes	>0.99	90	247	233	Yes	>0.99
	95	240	222	Yes	>0.99	95	253	233	Yes	>0.99

TABLE 6. (CONTINUED)

Grade	ELA/Reading					Math				
	Start %ile	RIT Spring	Projected Proficiency			Start %ile	RIT Spring	Projected Proficiency		
			Cut Score	Level 3	Prob.			Cut Score	Level 3	Prob.
7	5	193	227	No	<0.01	5	199	240	No	<0.01
	10	199	227	No	<0.01	10	206	240	No	<0.01
	15	202	227	No	<0.01	15	210	240	No	<0.01
	20	205	227	No	<0.01	20	214	240	No	<0.01
	25	208	227	No	<0.01	25	217	240	No	<0.01
	30	210	227	No	<0.01	30	219	240	No	<0.01
	35	212	227	No	<0.01	35	222	240	No	<0.01
	40	214	227	No	<0.01	40	224	240	No	<0.01
	45	216	227	No	<0.01	45	226	240	No	<0.01
	50	218	227	No	<0.01	50	229	240	No	<0.01
	55	220	227	No	0.01	55	231	240	No	<0.01
	60	222	227	No	0.06	60	233	240	No	0.01
	65	224	227	No	0.17	65	235	240	No	0.04
	70	226	227	No	0.38	70	238	240	No	0.25
	75	228	227	Yes	0.62	75	241	240	Yes	0.63
	80	231	227	Yes	0.89	80	244	240	Yes	0.92
	85	234	227	Yes	0.99	85	247	240	Yes	0.99
	90	238	227	Yes	>0.99	90	251	240	Yes	>0.99
	95	243	227	Yes	>0.99	95	258	240	Yes	>0.99
8	5	194	233	No	<0.01	5	199	249	No	<0.01
	10	200	233	No	<0.01	10	206	249	No	<0.01
	15	204	233	No	<0.01	15	211	249	No	<0.01
	20	207	233	No	<0.01	20	215	249	No	<0.01
	25	209	233	No	<0.01	25	218	249	No	<0.01
	30	212	233	No	<0.01	30	221	249	No	<0.01
	35	214	233	No	<0.01	35	224	249	No	<0.01
	40	216	233	No	<0.01	40	226	249	No	<0.01
	45	218	233	No	<0.01	45	229	249	No	<0.01
	50	220	233	No	<0.01	50	231	249	No	<0.01
	55	222	233	No	<0.01	55	233	249	No	<0.01
	60	224	233	No	<0.01	60	236	249	No	<0.01
	65	226	233	No	0.01	65	238	249	No	<0.01
	70	228	233	No	0.06	70	241	249	No	<0.01
	75	231	233	No	0.27	75	244	249	No	0.04
	80	233	233	Yes	0.50	80	247	249	No	0.25
	85	236	233	Yes	0.83	85	251	249	Yes	0.75
	90	240	233	Yes	0.99	90	255	249	Yes	0.98
	95	246	233	Yes	>0.99	95	262	249	Yes	>0.99

TABLE 6. (CONTINUED)

Grade	ELA/Reading					Math				
	Start %ile	RIT Spring	Projected Proficiency			Start %ile	RIT Spring	Projected Proficiency		
			Cut Score	Level 3	Prob.			Cut Score	Level 3	Prob.
10	5	192	236	No	<0.01	5	198	255	No	>0.99
	10	199	236	No	<0.01	10	206	255	No	<0.01
	15	203	236	No	<0.01	15	211	255	No	<0.01
	20	206	236	No	<0.01	20	215	255	No	<0.01
	25	209	236	No	<0.01	25	218	255	No	<0.01
	30	212	236	No	<0.01	30	221	255	No	<0.01
	35	214	236	No	<0.01	35	224	255	No	<0.01
	40	217	236	No	<0.01	40	227	255	No	<0.01
	45	219	236	No	<0.01	45	230	255	No	<0.01
	50	221	236	No	<0.01	50	232	255	No	<0.01
	55	223	236	No	<0.01	55	235	255	No	<0.01
	60	226	236	No	<0.01	60	238	255	No	<0.01
	65	228	236	No	0.01	65	240	255	No	<0.01
	70	230	236	No	0.03	70	243	255	No	<0.01
	75	233	236	No	0.17	75	246	255	No	<0.01
	80	236	236	Yes	0.50	80	250	255	No	0.04
	85	239	236	Yes	0.83	85	254	255	No	0.37
	90	244	236	Yes	0.99	90	259	255	Yes	0.92
	95	250	236	Yes	>0.99	95	267	255	Yes	>0.99

Note. %ile=percentile

TABLE 7. PROFICIENCY PROJECTION AND PROBABILITY FOR PASSING KAP ELA LEVEL 3 (PROFICIENT) WHEN MAP IS TAKEN IN THE FALL OR WINTER PRIOR TO SPRING KAP TESTS

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut Score	Level 3	Prob.			Cut Score	Level 3	Prob.
3	5	162	202	No	<0.01	5	171	202	No	<0.01
	10	168	202	No	<0.01	10	176	202	No	<0.01
	15	172	202	No	0.01	15	180	202	No	<0.01
	20	175	202	No	0.02	20	183	202	No	<0.01
	25	178	202	No	0.05	25	185	202	No	0.01
	30	180	202	No	0.08	30	188	202	No	0.03
	35	182	202	No	0.10	35	190	202	No	0.04
	40	184	202	No	0.16	40	192	202	No	0.09
	45	186	202	No	0.24	45	194	202	No	0.17
	50	188	202	No	0.29	50	196	202	No	0.28
	55	190	202	No	0.39	55	198	202	No	0.42
	60	192	202	Yes	0.50	60	199	202	Yes	0.50
	65	194	202	Yes	0.56	65	201	202	Yes	0.65
	70	197	202	Yes	0.71	70	204	202	Yes	0.83
	75	199	202	Yes	0.80	75	206	202	Yes	0.87
	80	202	202	Yes	0.87	80	208	202	Yes	0.94
	85	205	202	Yes	0.94	85	211	202	Yes	0.98
	90	209	202	Yes	0.97	90	215	202	Yes	>0.99
	95	214	202	Yes	0.99	95	221	202	Yes	>0.99
4	5	173	207	No	<0.01	5	179	207	No	<0.01
	10	178	207	No	<0.01	10	184	207	No	<0.01
	15	182	207	No	0.01	15	188	207	No	<0.01
	20	185	207	No	0.04	20	191	207	No	0.01
	25	188	207	No	0.07	25	194	207	No	0.02
	30	190	207	No	0.12	30	196	207	No	0.06
	35	192	207	No	0.18	35	198	207	No	0.12
	40	194	207	No	0.23	40	200	207	No	0.22
	45	196	207	No	0.33	45	202	207	No	0.28
	50	198	207	No	0.44	50	204	207	No	0.42
	55	200	207	Yes	0.50	55	205	207	Yes	0.50
	60	202	207	Yes	0.62	60	207	207	Yes	0.65
	65	204	207	Yes	0.73	65	209	207	Yes	0.78
	70	206	207	Yes	0.82	70	211	207	Yes	0.88
	75	209	207	Yes	0.88	75	214	207	Yes	0.96
	80	211	207	Yes	0.93	80	216	207	Yes	0.98
	85	214	207	Yes	0.96	85	219	207	Yes	0.99
	90	218	207	Yes	0.99	90	223	207	Yes	>0.99
	95	224	207	Yes	>0.99	95	228	207	Yes	>0.99

TABLE 7. (CONTINUED)

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut-Score	Level 3	Prob.			Cut-Score	Level 3	Prob.
5	5	181	216	No	<0.01	5	186	216	No	<0.01
	10	186	216	No	<0.01	10	191	216	No	<0.01
	15	190	216	No	<0.01	15	195	216	No	<0.01
	20	193	216	No	0.01	20	197	216	No	<0.01
	25	195	216	No	0.03	25	200	216	No	0.01
	30	198	216	No	0.05	30	202	216	No	0.01
	35	200	216	No	0.09	35	204	216	No	0.03
	40	202	216	No	0.15	40	206	216	No	0.06
	45	204	216	No	0.19	45	208	216	No	0.12
	50	206	216	No	0.28	50	210	216	No	0.22
	55	208	216	No	0.38	55	212	216	No	0.35
	60	210	216	Yes	0.50	60	214	216	Yes	0.50
	65	212	216	Yes	0.56	65	215	216	Yes	0.58
	70	214	216	Yes	0.67	70	218	216	Yes	0.78
	75	216	216	Yes	0.77	75	220	216	Yes	0.83
	80	218	216	Yes	0.81	80	222	216	Yes	0.91
	85	221	216	Yes	0.91	85	225	216	Yes	0.97
	90	225	216	Yes	0.96	90	229	216	Yes	>0.99
	95	231	216	Yes	>0.99	95	234	216	Yes	>0.99
6	5	186	222	No	<0.01	5	190	222	No	<0.01
	10	192	222	No	<0.01	10	196	222	No	<0.01
	15	196	222	No	<0.01	15	199	222	No	<0.01
	20	198	222	No	<0.01	20	202	222	No	<0.01
	25	201	222	No	0.01	25	204	222	No	<0.01
	30	203	222	No	0.03	30	207	222	No	0.01
	35	205	222	No	0.06	35	209	222	No	0.02
	40	207	222	No	0.07	40	211	222	No	0.04
	45	209	222	No	0.12	45	212	222	No	0.06
	50	211	222	No	0.19	50	214	222	No	0.12
	55	213	222	No	0.28	55	216	222	No	0.17
	60	215	222	No	0.33	60	218	222	No	0.28
	65	217	222	No	0.44	65	220	222	No	0.42
	70	219	222	Yes	0.56	70	222	222	Yes	0.58
	75	221	222	Yes	0.61	75	224	222	Yes	0.72
	80	224	222	Yes	0.77	80	226	222	Yes	0.83
	85	226	222	Yes	0.84	85	229	222	Yes	0.94
	90	230	222	Yes	0.93	90	233	222	Yes	0.99
	95	236	222	Yes	0.99	95	238	222	Yes	>0.99

TABLE 7. (CONTINUED)

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut-Score	Level 3	Prob.			Cut-Score	Level 3	Prob.
7	5	189	227	No	<0.01	5	192	227	No	<0.01
	10	195	227	No	<0.01	10	198	227	No	<0.01
	15	199	227	No	<0.01	15	201	227	No	<0.01
	20	202	227	No	<0.01	20	204	227	No	<0.01
	25	204	227	No	<0.01	25	207	227	No	<0.01
	30	206	227	No	0.01	30	209	227	No	<0.01
	35	209	227	No	0.02	35	211	227	No	<0.01
	40	211	227	No	0.04	40	213	227	No	0.01
	45	213	227	No	0.07	45	215	227	No	0.02
	50	214	227	No	0.10	50	217	227	No	0.04
	55	216	227	No	0.12	55	219	227	No	0.09
	60	218	227	No	0.19	60	221	227	No	0.17
	65	220	227	No	0.28	65	223	227	No	0.28
	70	222	227	No	0.39	70	225	227	No	0.42
	75	225	227	Yes	0.50	75	227	227	Yes	0.58
	80	227	227	Yes	0.61	80	230	227	Yes	0.78
	85	230	227	Yes	0.77	85	232	227	Yes	0.83
	90	234	227	Yes	0.88	90	236	227	Yes	0.96
	95	240	227	Yes	0.98	95	242	227	Yes	>0.99
8	5	191	233	No	<0.01	5	194	233	No	<0.01
	10	197	233	No	<0.01	10	199	233	No	<0.01
	15	201	233	No	<0.01	15	203	233	No	<0.01
	20	204	233	No	<0.01	20	206	233	No	<0.01
	25	207	233	No	<0.01	25	209	233	No	<0.01
	30	209	233	No	0.01	30	211	233	No	<0.01
	35	211	233	No	0.01	35	213	233	No	<0.01
	40	213	233	No	0.02	40	215	233	No	<0.01
	45	215	233	No	0.03	45	217	233	No	<0.01
	50	217	233	No	0.05	50	219	233	No	0.01
	55	219	233	No	0.08	55	221	233	No	0.02
	60	221	233	No	0.10	60	223	233	No	0.05
	65	223	233	No	0.16	65	225	233	No	0.10
	70	225	233	No	0.22	70	227	233	No	0.18
	75	228	233	No	0.31	75	229	233	No	0.29
	80	230	233	No	0.40	80	232	233	No	0.43
	85	234	233	Yes	0.60	85	235	233	Yes	0.64
	90	237	233	Yes	0.69	90	239	233	Yes	0.86
	95	243	233	Yes	0.90	95	244	233	Yes	0.98

TABLE 7. (CONTINUED)

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut-Score	Level 3	Prob.			Cut-Score	Level 3	Prob.
10	5	193	236	No	<0.01	5	194	236	No	<0.01
	10	199	236	No	<0.01	10	200	236	No	<0.01
	15	203	236	No	<0.01	15	204	236	No	<0.01
	20	206	236	No	<0.01	20	207	236	No	<0.01
	25	209	236	No	<0.01	25	210	236	No	<0.01
	30	212	236	No	0.01	30	212	236	No	<0.01
	35	214	236	No	0.02	35	215	236	No	<0.01
	40	216	236	No	0.03	40	217	236	No	<0.01
	45	218	236	No	0.04	45	219	236	No	<0.01
	50	220	236	No	0.07	50	221	236	No	0.01
	55	223	236	No	0.12	55	223	236	No	0.02
	60	225	236	No	0.17	60	225	236	No	0.05
	65	227	236	No	0.23	65	227	236	No	0.09
	70	229	236	No	0.30	70	230	236	No	0.20
	75	232	236	No	0.42	75	232	236	No	0.31
	80	235	236	Yes	0.54	80	235	236	Yes	0.50
	85	238	236	Yes	0.66	85	238	236	Yes	0.69
	90	242	236	Yes	0.80	90	242	236	Yes	0.88
	95	248	236	Yes	0.93	95	248	236	Yes	0.99

Note. %ile=percentile

TABLE 8. PROFICIENCY PROJECTION AND PROBABILITY FOR PASSING KAP MATH  
LEVEL 3 (PROFICIENT) WHEN MAP IS TAKEN IN THE FALL OR WINTER PRIOR TO  
SPRING KAP TESTS

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut Score	Level 3	Prob.			Cut Score	Level 3	Prob.
3	5	169	204	No	<0.01	5	176	204	No	<0.01
	10	174	204	No	0.01	10	181	204	No	<0.01
	15	177	204	No	0.02	15	184	204	No	<0.01
	20	179	204	No	0.04	20	187	204	No	0.01
	25	182	204	No	0.11	25	189	204	No	0.02
	30	184	204	No	0.14	30	191	204	No	0.05
	35	185	204	No	0.17	35	193	204	No	0.10
	40	187	204	No	0.27	40	195	204	No	0.20
	45	189	204	No	0.38	45	197	204	No	0.34
	50	190	204	No	0.44	50	198	204	No	0.42
	55	192	204	Yes	0.56	55	200	204	Yes	0.58
	60	194	204	Yes	0.68	60	202	204	Yes	0.74
	65	195	204	Yes	0.73	65	203	204	Yes	0.80
	70	197	204	Yes	0.83	70	205	204	Yes	0.90
	75	199	204	Yes	0.86	75	207	204	Yes	0.95
	80	201	204	Yes	0.92	80	209	204	Yes	0.98
	85	204	204	Yes	0.97	85	212	204	Yes	>0.99
	90	207	204	Yes	0.99	90	215	204	Yes	>0.99
	95	212	204	Yes	>0.99	95	220	204	Yes	>0.99
4	5	179	220	No	<0.01	5	185	220	No	<0.01
	10	184	220	No	<0.01	10	190	220	No	<0.01
	15	188	220	No	<0.01	15	194	220	No	<0.01
	20	190	220	No	<0.01	20	197	220	No	<0.01
	25	193	220	No	0.01	25	199	220	No	<0.01
	30	195	220	No	0.02	30	201	220	No	<0.01
	35	197	220	No	0.04	35	203	220	No	0.01
	40	198	220	No	0.06	40	205	220	No	0.02
	45	200	220	No	0.11	45	207	220	No	0.05
	50	202	220	No	0.17	50	209	220	No	0.10
	55	204	220	No	0.27	55	211	220	No	0.20
	60	205	220	No	0.27	60	212	220	No	0.26
	65	207	220	No	0.38	65	214	220	No	0.42
	70	209	220	Yes	0.50	70	216	220	Yes	0.58
	75	211	220	Yes	0.62	75	218	220	Yes	0.74
	80	214	220	Yes	0.78	80	221	220	Yes	0.90
	85	216	220	Yes	0.86	85	223	220	Yes	0.95
	90	220	220	Yes	0.96	90	227	220	Yes	0.99
	95	225	220	Yes	0.99	95	232	220	Yes	>0.99

TABLE 8. (CONTINUED)

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut-Score	Level 3	Prob.			Cut-Score	Level 3	Prob.
5	5	187	232	No	<0.01	5	192	232	No	<0.01
	10	193	232	No	<0.01	10	198	232	No	<0.01
	15	196	232	No	<0.01	15	201	232	No	<0.01
	20	199	232	No	<0.01	20	204	232	No	<0.01
	25	202	232	No	<0.01	25	207	232	No	<0.01
	30	204	232	No	<0.01	30	209	232	No	<0.01
	35	206	232	No	0.01	35	211	232	No	<0.01
	40	208	232	No	0.02	40	213	232	No	<0.01
	45	210	232	No	0.04	45	215	232	No	<0.01
	50	211	232	No	0.05	50	217	232	No	0.01
	55	213	232	No	0.09	55	219	232	No	0.03
	60	215	232	No	0.15	60	221	232	No	0.07
	65	217	232	No	0.23	65	223	232	No	0.15
	70	219	232	No	0.33	70	225	232	No	0.27
	75	221	232	No	0.44	75	228	232	Yes	0.50
	80	224	232	Yes	0.62	80	230	232	Yes	0.66
	85	227	232	Yes	0.77	85	233	232	Yes	0.85
	90	230	232	Yes	0.88	90	237	232	Yes	0.97
	95	236	232	Yes	0.98	95	242	232	Yes	>0.99
6	5	192	233	No	<0.01	5	196	233	No	<0.01
	10	198	233	No	<0.01	10	202	233	No	<0.01
	15	202	233	No	<0.01	15	205	233	No	<0.01
	20	205	233	No	<0.01	20	209	233	No	<0.01
	25	207	233	No	<0.01	25	211	233	No	<0.01
	30	209	233	No	0.01	30	214	233	No	<0.01
	35	212	233	No	0.03	35	216	233	No	<0.01
	40	214	233	No	0.05	40	218	233	No	0.01
	45	216	233	No	0.09	45	220	233	No	0.02
	50	218	233	No	0.15	50	222	233	No	0.05
	55	220	233	No	0.23	55	224	233	No	0.11
	60	222	233	No	0.33	60	226	233	No	0.20
	65	224	233	No	0.44	65	228	233	No	0.34
	70	226	233	Yes	0.56	70	230	233	Yes	0.50
	75	228	233	Yes	0.67	75	233	233	Yes	0.73
	80	231	233	Yes	0.81	80	236	233	Yes	0.89
	85	234	233	Yes	0.88	85	239	233	Yes	0.97
	90	238	233	Yes	0.96	90	243	233	Yes	>0.99
	95	243	233	Yes	0.99	95	248	233	Yes	>0.99

TABLE 8. (CONTINUED)

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut-Score	Level 3	Prob.			Cut-Score	Level 3	Prob.
7	5	195	240	No	<0.01	5	198	240	No	<0.01
	10	201	240	No	<0.01	10	204	240	No	<0.01
	15	205	240	No	<0.01	15	208	240	No	<0.01
	20	209	240	No	<0.01	20	212	240	No	<0.01
	25	211	240	No	<0.01	25	215	240	No	<0.01
	30	214	240	No	<0.01	30	217	240	No	<0.01
	35	216	240	No	<0.01	35	220	240	No	<0.01
	40	218	240	No	0.01	40	222	240	No	<0.01
	45	221	240	No	0.02	45	224	240	No	<0.01
	50	223	240	No	0.05	50	226	240	No	0.01
	55	225	240	No	0.08	55	228	240	No	0.02
	60	227	240	No	0.14	60	230	240	No	0.05
	65	229	240	No	0.22	65	233	240	No	0.15
	70	231	240	No	0.32	70	235	240	No	0.26
	75	234	240	Yes	0.50	75	238	240	Yes	0.50
	80	237	240	Yes	0.68	80	240	240	Yes	0.66
	85	240	240	Yes	0.82	85	244	240	Yes	0.90
	90	244	240	Yes	0.94	90	248	240	Yes	0.98
	95	250	240	Yes	0.99	95	254	240	Yes	>0.99
8	5	197	249	No	<0.01	5	199	249	No	<0.01
	10	203	249	No	<0.01	10	206	249	No	<0.01
	15	208	249	No	<0.01	15	210	249	No	<0.01
	20	211	249	No	<0.01	20	214	249	No	<0.01
	25	214	249	No	<0.01	25	217	249	No	<0.01
	30	217	249	No	<0.01	30	220	249	No	<0.01
	35	219	249	No	<0.01	35	222	249	No	<0.01
	40	222	249	No	<0.01	40	225	249	No	<0.01
	45	224	249	No	<0.01	45	227	249	No	<0.01
	50	226	249	No	0.01	50	229	249	No	<0.01
	55	229	249	No	0.02	55	231	249	No	<0.01
	60	231	249	No	0.04	60	234	249	No	<0.01
	65	233	249	No	0.08	65	236	249	No	0.01
	70	236	249	No	0.12	70	239	249	No	0.06
	75	238	249	No	0.18	75	241	249	No	0.12
	80	241	249	No	0.30	80	245	249	No	0.35
	85	245	249	Yes	0.50	85	248	249	Yes	0.58
	90	249	249	Yes	0.70	90	253	249	Yes	0.88
	95	256	249	Yes	0.92	95	259	249	Yes	0.99

TABLE 8. (CONTINUED)

Grade	Start %ile	RIT Fall	Projected Proficiency			Start %ile	RIT Winter	Projected Proficiency		
			Cut-Score	Level 3	Prob.			Cut-Score	Level 3	Prob.
10	5	198	255	No	<0.01	5	199	255	No	<0.01
	10	205	255	No	<0.01	10	206	255	No	<0.01
	15	210	255	No	<0.01	15	211	255	No	<0.01
	20	214	255	No	<0.01	20	215	255	No	<0.01
	25	217	255	No	<0.01	25	218	255	No	<0.01
	30	220	255	No	<0.01	30	221	255	No	<0.01
	35	223	255	No	<0.01	35	224	255	No	<0.01
	40	225	255	No	<0.01	40	226	255	No	<0.01
	45	228	255	No	<0.01	45	229	255	No	<0.01
	50	230	255	No	<0.01	50	232	255	No	<0.01
	55	233	255	No	0.01	55	234	255	No	<0.01
	60	235	255	No	0.02	60	237	255	No	<0.01
	65	238	255	No	0.05	65	239	255	No	<0.01
	70	240	255	No	0.07	70	242	255	No	0.01
	75	243	255	No	0.13	75	245	255	No	0.05
	80	247	255	No	0.25	80	248	255	No	0.13
	85	250	255	No	0.37	85	252	255	No	0.36
	90	255	255	Yes	0.59	90	257	255	Yes	0.71
	95	262	255	Yes	0.84	95	264	255	Yes	0.97

Note. %ile=percentile

## Summary and Discussion

This study produced a set of cut scores on MAP reading and math tests for Grades 3-8 and Grade 10 that correspond to each KAP performance level. By using matched score data from a sample of students from Kansas, the study demonstrates that MAP scores can accurately predict whether a student could be proficient or above on the basis of his/her MAP scores. This study also used the NWEA 2015 RIT Scale norming study results to project a student's probability to meet proficiency based on that student's prior MAP scores in fall and winter. These results will help educators predict student performance in KAP tests as early as possible and identify those students who are at risk of failing to meet required standards so that they can receive necessary resources and assistance to meet their goals.

While concordance tables can be helpful and informative, they have general limitations. First, the concordance tables provide information about score comparability on different tests, but the scores cannot be assumed to be interchangeable. In the case for KAP and MAP tests, as they are not parallel in content, scores from these two tests should not be directly compared. Second, the sample data used in this study were collected from 80 schools in Kansas, which may limit the generalizability of the results to test takers who differ significantly from this sample. Finally, cautions should also be exercised if the concorded scores are used for a subpopulation. NWEA will continue to gather information about KAP performance from other schools to enhance the quality and generalizability of the study.

## References

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## Appendix

### Data and Analysis

#### Data

Data used in this study were collected from 80 schools in Kansas. The sample contained matched KAP ELA and MAP reading scores from 18,216 students in Grades 3 to 8 and Grade 10 and matched KAP and MAP math scores from 18,616 students in Grades 3 to 8 and Grade 10 who completed both KAP and MAP in the spring of 2015.

To understand the statistical characteristics of the test scores, descriptive statistics are provided in Table A1. As Table A1 indicates, the correlation coefficients between MAP reading and KAP ELA scores range from 0.83 to 0.85, and the correlation coefficients between MAP and KAP math scores range from 0.79 to 0.88. All these correlations indicate a strong relationship between MAP and KAP test scores.

TABLE A1. DESCRIPTIVE STATISTICS OF THE SAMPLE DATA

Subject	Grade	N	r	KAP				MAP			
				Mean	SD	Min	Max	Mean	SD	Min	Max
ELA/ Reading	3	3,339	0.85	301	25.04	220	380	201	14.86	149	239
	4	3,099	0.84	306	24.98	236	377	209	14.61	149	246
	5	3,156	0.84	301	24.07	225	373	215	13.87	149	252
	6	2,979	0.83	296	24.10	220	361	218	13.90	151	256
	7	2,415	0.83	293	24.34	220	353	222	13.97	151	266
	8	2,413	0.84	286	24.80	220	356	225	14.30	160	263
	10	815	0.83	278	23.24	220	348	222	16.42	157	264
Math	3	3,359	0.85	305	24.10	240	380	205	12.86	146	249
	4	3,135	0.87	296	24.79	233	379	316	14.37	143	276
	5	3,203	0.88	294	24.35	240	380	226	16.88	157	280
	6	3,014	0.84	296	24.79	243	380	227	15.81	155	281
	7	2,547	0.83	288	23.01	238	380	230	15.20	156	274
	8	2,491	0.79	280	20.19	228	369	233	15.00	153	276
	10	867	0.79	280	21.51	225	374	236	18.99	168	299

## Equipercentile Linking Procedure

The equipercentile procedure (e.g., Kolen & Brennan, 2004) was used to establish the concordance relationship between KAP and MAP scores for grades 3-8 and grade 10 in ELA/reading and math. This procedure matches scores on the two scales that have the same percentile rank (i.e., the proportion of scores at or below each score).

Suppose we need to establish the concorded scores between two tests.  $x$  is a score on Test  $X$  (e.g., KAP). Its equipercentile equivalent score on Test  $Y$  (e.g., MAP),  $e_y(x)$ , can be obtained through a cumulative-distribution-based linking function defined in Equation (A1):

$$e_y(x) = G^{-1}[P(x)] \quad (\text{A1})$$

where  $e_y(x)$  is the equipercentile equivalent of scores on KAP on the scale of MAP,  $P(x)$  is the percentile rank of a given score on Test  $X$ .  $G^{-1}$  is the inverse of the percentile rank function for scores on Test  $Y$  which indicates the scores on Test  $Y$  corresponding to a given percentile. Polynomial loglinear pre-smoothing was applied to reduce irregularities of the frequency distributions as well as equipercentile linking curve.

## Consistency rate of Classification

Consistency rate of classification accuracy, expressed in the form of a rate between 0 and 1, measures the extent to which MAP scores (and the estimated MAP cut scores) accurately predicted whether students in the sample would be proficient (i.e., Level 3 or higher) on KAP tests.

To calculate consistency rate of classification, sample students were designated “Below KAP cut” or “At or above KAP cut” based on their actual KAP scores. Similarly, they were also designated as “Below MAP cut” or “At or above MAP cut” based on their actual MAP scores. A 2-way contingency table was then tabulated (see Table A2), classifying students as “Proficient” on the basis of KAP cut score and concordant MAP cut score. Students classified in the *true positive* (TP) category were those predicted to be Proficient based on the MAP cut scores and were also classified as Proficient based on the KAP cut scores. Students classified in the *true negative* (TN) category were those predicted to be Not Proficient based on the MAP cut scores and were also classified as Not Proficient based on the KAP cut scores. Students classified in the *false positive* (FP) category were those predicted to be Proficient based on the MAP cut scores but were classified as Not Proficient based on the KAP cut scores. Students classified in the *false negative* (FN) category were those predicted to be Not Proficient based on the MAP cut scores but were classified as Proficient based on the KAP cut scores. The overall consistency rate of classification was computed as the proportion of correct classifications among the entire sample by  $(\text{TP}+\text{TN}) / (\text{TP}+\text{TN}+\text{FP}+\text{FN})$ .

TABLE A2. DEFINITION OF CONSISTENCY RATE FOR KAP TO MAP CONCORDANCE

		KAP Score	
		Below KAP cut	At or Above KAP cut
MAP Score	Below MAP cut	True Negative	False Positive
	At or Above MAP cut	False Negative	True Positive

Note. Shaded cells are summed to compute the consistency rate.

### Proficiency Projection

MAP conditional growth norms provide student's expected gain scores across testing seasons (Thum & Hauser, 2015). This information is utilized to predict a student's performance on the KAP based on that student's MAP scores in prior seasons (e.g. fall and winter). The probability of a student achieving Level 3 (Proficient) on KAP, based on his/her fall or winter MAP score is given in Equation (A2):

$$Pr(\text{Achieving Level 3 in spring} | \text{a RIT score of } x) = 1 - \Phi\left(\frac{x + g - c}{SD}\right) \quad (\text{A2})$$

where,  $\Phi$  is a standardized normal cumulative distribution,  $x$  is the student's RIT score in fall or winter,  $g$  is the expected growth from fall or winter to spring corresponding to  $x$ ,  $c$  is the MAP cut-score for spring, and  $SD$  is the conditional standard deviation of growth from fall or winter to spring.

For the probability of a student achieving Level 3 on the KAP tests, based on his/her spring score  $s$ , it can be calculated by Equation (A3):

$$Pr(\text{Achieving Level 3 in spring} | \text{a RIT score of } s \text{ in spring}) = 1 - \Phi\left(\frac{s - c}{SE}\right) \quad (\text{A3})$$

where  $SE$  is the standard error of measurement for MAP reading or math test.

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